UECM1404 Theory of Interest Test 2 Practice

PRACTICE

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Q1. You took a loan of 300,000 which required to pay 25 equal annual payments at 11% interest. The payments are due at the end of each year. The bank sold your loan to an investor immediately after receiving your 6th payment. With yield to the investor of 8%, the price the investor pay was 342,100. Determine the bank's overall return on its investment.

Q2. Steven have a 30-year 180,000 mortgage with an 9% interest rate convertibele monthly. Payments are made at the end of the month. Immediate after the 120th payment, he refinance the mortgage. The iterest rate is reduced to 7.5%, convertibele monthly, and the term is reduced to 20 years (so there are 10 years of payments remainning). He also make an additional payment of 24,000 at the time of refinancing. Calculate his new monthly payment.

Q3. A loan of 60,000 is being repaid by 16 equal annual installments made at the end of each year at 8% interest effective annually. Immediately after the 5-th payment, the loan is renegotiated as follows:

- The borrower will make 11 annual payments

of K to repay the loan, with the first payment three years from the date of renegotiation.

- The interest rate is changed to 9.5% effective annually.

Calculate K.

Q4. Don takes out a 19-year loan of L, which repays with annual payments at the end of each year using the amortization method. Interest on the loan is charged at an annual effective rate of i. Don repays the loan with a decreasing series of payments. He repays 1,900 in year one, 1,800 in year two, 1,700 in year three, ..., and 100 in year 19. The amount of principal repaid in year three is equal to 942.12. Calculate L.

Q5. A loan of \$100,000 is being amortized with payments at the end of each year for 12 years. If $v^6 = 0.88$, find the amount of principal repaid in the first 6 years. Answer to nearest dollars.

Q6. A 30-year 6,000 par value bond with 10% semiannual coupons is purchansed to earn a yield of 9% convertible semiannually. What is the price of the bond?

Q7. Laura buys two bonds at time 0. Bond X is a 3,000 par value 15-year bond with 13% annual coupons.

It is bought at a price to yield an annual effective rate of 11%. Bond Y is a 15-year par value bond with 8.775% annual coupons and a face amount of F. Laura pays P for Bond Y to yield an annual effective rate of 11%. During year 7, the write-down in premium (principal adjustment) on bond X is equal to the write-up in discount (principal adjustment) on bond Y. Calculate P.

Q8. Fund A is invested at an effective annual interest rate of 6%. Fund B is invested at an effective annual interest rate of 5%. At the end of 27 years, the total in the two funds is 14,000. At the end of 38 years, the amount in Fund A is twice the amount in Fund B. Calculate the total in the two funds at the end of 14 years.

Q9. Jeff deposits 15 into a fund today and 30 23-year later. Interest for the first 6 years is credited at a nominal discount rate of d compounded quarterly, and thereafter at a nominal interest rate of 8% compounded semiannually. The accumulated balance in the fund at the end of 40 years is 406. Calculate d.

Q10.You are given:

(i)$\delta_t = \frac{1}{8+t}$; and

(ii)the total interest earned during the first n years on an investment of 1 at time $t = 0$ is 1.6.

Determine n.